CLAIMS

What is claimed is:

1. A method of calibrating the light system in a flying spot scanner or telecine machine using a cathode ray tube light source and a photosensitive detector, wherein:

at a first level of light transmitted to the photosensitive detector a control signal to the photosensitive detector is adjusted to obtain a predetermined video signal, and the value of the control signal is noted;

at a plurality of other levels of light transmitted to the photosensitive detector, the control signal to the photosensitive detector is adjusted to obtain the predetermined video signal, and the values of the respective control signals are noted; and

a lookup table is created of calibration values for different levels of light transmitted to the photosensitive detector, so that during normal operation of the telecine machine values in the table can be used to obtain calibration information for different levels of light transmitted to the photosensitive detector.

2. A method as claimed in claim 1, wherein the level of light transmitted to the photosensitive detector is set at different levels by inserting filters of different known density in the light path.

3. A method as claimed in claim 1, wherein the calibration values are obtained at approximately 1 dB intervals.

4. A method of calibrating the light system in a flying spot scanner or telecine machine using a

cathode ray tube light source, a photosensitive detector, and a burn corrector system, the burn corrector system being operative during the calibration and serving to adjust a control signal for the photosensitive detector in accordance with variations in the output of the cathode ray tube, wherein:

at a first level of drive current for the cathode ray tube a control signal to the photosensitive detector is adjusted to obtain a desired video signal parameter, and the value of the control signal is noted;

at a plurality of other levels of cathode ray tube drive current, the control signal to the photosensitive detector is adjusted to obtain desired video signal parameters, and the values of the respective control signals are noted; and

a lookup table is created of calibration values for different levels of light, so that during normal operation of the telecine machine values in the lookup table can be used to obtain calibration information for different levels of light transmitted to the photosensitive detector;

wherein the video signal parameters are virtual video signal levels taking into account signals from the burn detector.

5. A method as claimed in claim 4, wherein the burn detector includes a black level clamping system which is calibrated prior to adjusting and recording the control signals at the various light levels so as to account for inaccuracies in the black level burn clamping system on the results of the calibration method.

6. A method as claimed in claim 4, wherein the virtual video signal levels are obtained using a

software implementation of the burn correction circuitry present in the scanner or telecine machine.

7. A method as claimed in claim 6, wherein the actual video signal levels obtained at the photosensitive detector and corresponding signals from the burn detector are used by the software implementation of the burn correction circuitry to calculate the virtual video signal levels.

8. A method as claimed in claim 7, wherein the method is carried out in a frame blanking interval during which no film image is being scanned such that the calibration can be carried out for each frame of film.

9. A method as claimed in claim 4, wherein any shading correction provided in the scanner or telecine machine is disabled prior to adjusting and recording the control signals at the various light levels.

10. A method as claimed in claim 4, wherein the user interface to the flying spot scanner or telecine is locked out prior to adjusting and recording the control signals at the various light levels.

11. A method as claimed in claim 4, wherein the initial settings of parameters of the flying spot scanner or telecine which will be altered during the calibration process are recorded prior to adjusting and recording the control signals at the various light levels.

12. A method as claimed in claim 4, the method being automated such that it can be carried out automatically at the request of a user.

13. A method as claimed in claim 4, wherein the adjustment of the control signal to the photosensitive detector is carried out iteratively.

14. A method as claimed in claim 13, wherein means are provided for allowing a user to specify the number of iterative loops required.

15. A method as claimed in claim 4, wherein the method is carried out in a frame blanking interval during which no film image is being scanned such that the calibration can be carried out for each frame of film.

16. A method as claimed in claim 15, wherein means are provided for allowing light which has not been modulated by the film in the scanner or telecine to be detected by the photosensitive detector during the frame blanking interval.

17. A method as claimed in claim 16, wherein light which has not been modulated by the film is detected from a part of the surface of the cathode ray tube which is not normally used for scanning the film and which is illuminated during the frame blanking interval.

18. A method as claimed in claim 17, wherein the means for allowing light which has not been modulated by the film to be detected comprise semi-silvered and/or fully silvered mirrors for deflecting light from the CRT around the film.

19. A method as claimed in claim 18, wherein the mirrors are arranged in a periscope type arrangement.

20. A method as claimed in claim 18, wherein the mirrors are arranged to deflect only the light emitted

from the part of the surface of the cathode ray tube which is not normally used for scanning the film.

21. A method as claimed in claim 18, wherein neutral density filters are provided in the optical path of the mirrors to avoid video overload of the uncorrected signal from occurring.

22. A method as claimed in claim 1, wherein the method is carried out when there is no film in the scanner or telecine machine, and the lookup table obtained is applied to the data obtained during subsequent scanning operations until the calibration method is repeated.

23. A method of calibrating the light system in a flying spot scanner or telecine machine using a cathode ray tube light source, a photosensitive detector which will always obtain a video signal corresponding to the level of light transmitted to it, and a burn corrector system, the burn corrector system being operative during the calibration and serving to adjust a control signal for the photosensitive detector in accordance with variations in the output of the cathode ray tube, the method comprising:

(A) performing a first calibration including carrying out the following functions when there is no film in the scanner:

(i) at a first level of light transmitted to the photosensitive detector, the photosensitive detector obtaining an actual video signal corresponding to the level of light, adjusting a control signal to the photosensitive detector to obtain a predetermined video signal and noting the value of the control signal;

(ii) at a plurality of other levels of light transmitted to the photosensitive detector, the photosensitive detector obtaining an actual video

signal corresponding to each of the other levels of light, adjusting the control signal to the photosensitive detector to obtain the predetermined video signal and noting the values of the respective control signals; and

(iii) creating a lookup table of calibration values for different levels of light transmitted to the photosensitive detector, so that during normal operation of the telecine machine values in the table can be used to obtain calibration information for different levels of light transmitted to the photosensitive detector;

(B) applying the lookup table to data obtained during subsequent scanning operations until the first calibration method is repeated;

(C) performing the calibration method as claimed in claim 8; and

(D) comparing the actual video signals obtained by the photodetector during the first calibration with the actual video signals obtained when calibrating the system according to the method of claim 14, so as to detect any change over time in the levels of the actual video signals obtained.

24. Software for automatically implementing the method as claimed claim 1.

25. Software for automatically implementing the method as claimed claim 4.

26. Apparatus for implementing the method as claimed in claim 4.

27. A flying spot scanner or telecine machine comprising a cathode ray tube and a photosensitive detector for detecting light transmitted through the film during use, wherein means are provided for allowing light which has not been modulated by the

film during use to be detected by the photosensitive detector during the frame blanking interval.

28. A flying spot scanner or telecine as claimed in claim 27, wherein light which has not been modulated by the film is detected from a part of the surface of the cathode ray tube which is not normally used for scanning the film and which is illuminated during the frame blanking interval.

29. A flying spot scanner or telecine as claimed in claim 27, wherein the means for allowing light which has not been modulated by the film to be detected comprise semi-silvered and/or fully silvered mirrors for deflecting light from the CRT around the film.

30. A flying spot scanner or telecine as claimed in claim 29, wherein the mirrors are arranged in a periscope type arrangement.

31. A flying spot scanner or telecine as claimed in claim 29, wherein the mirrors are arranged to deflect only the light emitted from the part of the surface of the cathode ray tube which is not normally used for scanning the film.

32. A flying spot scanner or telecine as claimed in claim 29, wherein neutral density filters are provided in the optical path of the mirrors to avoid video overload of the uncorrected signal from occurring.